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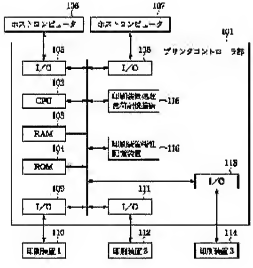
(54) PRINTER CONTROLLER, PRINTER, DATA PROCESSING METHOD OF PRINTER CONTROLLER AND STORAGE MEDIUM WITH PROGRAM READABLE BY COMPUTER STORED THEREIN

(57)Abstract:
PROBLEM TO BE SOLVED: To make efficiently obtainable, printing results in a short time even if plural pieces of print job data are parallelly received from plural data processors.
SOLUTION: When plural pieces of print job data are parallelly received from plural host computers 106 and 107 through corresponding interfaces 105 and 108 and plural printers to which the received print job data can be transferred exist, the data processing load information of each printer 110, 112 and 114 is acquired and stored in a printer processing load storage device 115, and the selection candidates of printers to be transferred are optimized by taking the stored data processing load information of each processor, attribute information stored in a printer characteristic storage device 116 and the print job data into consideration.



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* NOTICES *

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2.**** shows the word which can not be translated.
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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention individually print job data from two or more data processing devices via predetermined communication media Two or more 1st interfaces receivable parallel, It is related with the storage which stored the program which the data processing method and computer of a print control unit, a printer, and a print control unit which have two or more printers and two or more 2nd interfaces that can be communicated can read.
[0002]
[Description of the Prior Art]When the print job which receives from a host via predetermined communication media is conventionally processed in this kind of print control unit, Each print job which received from the host was read one by one, the printing job was performed, and sequential operation was performed when print data distributed the print data generated and this generated to a printer.
[0003]
[Problem(s) to be Solved by the Invention]However, when two or more print jobs constitute a printing system with the print control unit in which parallel processing is possible, When distribution processing of two or more print jobs is carried out at two or more selectable printers, respectively, There was a problem that a printing job speed more synthetic than the case where the processing load became high superfluously depending on the combination of the contents of each print job at the time of a printing job, and carries out sequential execution of the print job will fall rapidly.
[0004]Were made in order that this invention might solve the above-mentioned problem, and two or more print job data are received in parallel from two or more data processing devices, When two or more printers which can transmit the received this print job data exist, Acquire the data processing load information of each printer, memorize, and by optimizing the election candidate of a printer who should take into consideration and transmit the data processing load information and these print job data of each printer which have been this memorized, The situation which chooses a mistaken printer whose data-processing burden increases superfluously is avoided, Two or more print job data are received in parallel from two or more data processing devices. ** -- it is providing the

storage which stored efficiently the program which the data processing method and computer of a print control unit, a printer, and a print control unit which can fix the printing job environment a printed result being obtained, free can read for a short time.
[0005]
[Means for Solving the Problem]The 1st invention concerning this invention individually print job data via predetermined communication media from two or more data processing devices (host computer 106,107 shown in drawing 1) Two or more 1st interfaces (interface 105,108 shown in drawing 1) receivable parallel, Two or more printers and two or more 2nd interfaces (printer interface 109,111,113 shown in drawing 1) that can be communicated, An acquisition means (CPU102 shown in drawing 1 executes and carries out acquisition processing of the control program memorized by ROM104 or memory resource which is not illustrated) which acquires data processing load information on each printer changed with printing job execution, The 1st memory measure (it memorizes in a data format which is the printer processing-load memory storage 115 shown in drawing 1, and is shown in drawing 2) that memorizes data processing load information on each printer acquired by said acquisition means, The 2nd memory measure (it memorizes in a data format which is the printer characteristic memory storage 116 shown in drawing 1, and is shown in drawing 3) that memorizes the 1st and 2nd attribution information of each printer, An analysis means (CPU102 shown in drawing 1 executes and carries out analysis processing of the control program memorized by ROM104 or memory resource which is not illustrated) to analyze the attribute of print job data received from one of data processing devices, The 1st and 2nd attribution information of each printer memorized by data processing load information or said 2nd memory measure of each printer memorized by an attribute and said 1st memory measure of said print job data analyzed by said analysis means is compared. A selecting means (CPU102 shown in drawing 1 executes a control program memorized by ROM104 or memory resource which is not illustrated, and carries out election processing) which elects a printer which should print these print job data, It has a transfer means (CPU102 shown in drawing 1 executes a control program memorized by ROM104 or memory resource which is not illustrated, and carries out transmission processing) which shifts and transmits these print job data to that printer to be elected by said selecting means.
[0006]The 2nd invention concerning this invention said selecting means, The 1st attribution information of each printer memorized by the characteristic and said 2nd memory measure of said print job data analyzed by said analysis means is compared. The 1st selection means (CPU102 shown in drawing 1 executes a control program memorized by ROM104 or memory resource which is not illustrated, and carries out selection processing) that selects a selectable adapted printer, Data processing load information on each printer memorized by said 1st memory measure based on the number of candidates of a printer selected by said 1st selection means is referred to. The 2nd selection means (CPU102 shown in drawing 1 executes a control program memorized by ROM104 or memory resource which is not illustrated, and carries out selection processing) that selects a selectable printer, The 2nd different attribution information from said 1st attribution information memorized by said 2nd memory measure based on the number of candidates of a printer selected by said 2nd selection means is compared with the characteristic of said print job data. The 3rd selection means (CPU102 shown in drawing 1 executes a control program memorized by ROM104 or memory resource which is not

illustrated, and carries out selection processing) that selects a selectable adapted printer, A high printer of a selection priority is made into a candidate in two or more printers memorized by said 1st memory measure based on the number of candidates of a printer selected by said 3rd selection means. It has the 4th selection means (CPU102 shown in drawing 1 executes a control program memorized by ROM104 or memory resource which is not illustrated, and carries out selection processing) to select.

[0007]The 3rd invention concerning this invention said selecting means, When the number of candidates of a printer selected by said 1st [the] - the 3rd selection means (CPU102 shown in drawing 1 executes a control program memorized by ROM104 or memory resource which is not illustrated, and carries out selection processing) is the singular number, A printer selected by each 1st [the / -] and the 3rd selection means is elected as a printer which should print print job data.

[0008]The 4th invention concerning this invention acquires periodically data processing load information on each printer that said acquisition means is changed with printing job execution from each printer by communication.

[0009]From resources information of each printer acquired beforehand, the 5th invention concerning this invention has an anticipation means (CPU102 shown in drawing 1 executes a control program memorized by ROM104 or memory resource which is not illustrated, and carries out anticipation processing) to expect a rate of change of a processing load, and said selecting means, When the number of candidates of a printer selected by said 2nd selection means is plurality, one which should print print job data based on a potential result of said anticipation means of printers is elected.

[0010]The 6th invention concerning this invention is a print control unit and a printer (printer 110,112,114 shown in drawing 1) which can be communicated which control two or more of other printers via predetermined communication media, A creating means which analyzes print job data received from said print control unit, and generates print data which can print a printing department, A measuring means (printer CPU of the printer 110,112,114 shown in drawing 1 executes and carries out the measuring process of the control program memorized by ROM of a printer) which measures a data-processing burden by said creating means, Based on an acquisition request from said print control unit, by said measuring means. It has a transfer means (printer CPU of the printer 110,112,114 shown in drawing 1 executes a control program memorized by ROM of a printer, and carries out transmission processing) which transmits measured data processing load information to said print control unit.

[0011]The 7th invention concerning this invention individually print job data via predetermined communication media from two or more data processing devices (host computer 106,107 shown in drawing 1) Two or more 1st interfaces (interface 105,108 shown in drawing 1) receivable parallel, It is a data processing method of a print control unit which has two or more printers and two or more 2nd interfaces (printer interface 109,111,113 shown in drawing 1) that can be communicated, An acquisition process (step (1) of drawing 6) of acquiring data processing load information on each printer changed with printing job execution, A registration process (step (1) of drawing 6) of registering into a memory data processing load information on each printer acquired by said acquisition process, An analysis process (step (3) of drawing 6) which analyzes the attribute of print job data received from one of data processing devices, According to said analysis process. The characteristic and the 1st and 2nd attribution information of said

print job data of each printer memorized by data processing load information or said memory of each printer registered into an attribute and said memory of said analyzed print job data are compared. An election process (step (4) of drawing 6) of electing a printer which should print these print job data, It has a transfer process (step (5) of drawing 6) which shifts and transmits these print job data to that printer to be elected by said election process.

[0012]The 8th invention concerning this invention said election process, The 1st selection process (step (1) of drawing 7) that selects a selectable printer which compares the 1st attribution information of each printer memorized by the characteristic and said memory of said print job data analyzed by said analysis process, and is adapted, The 2nd selection process (a step (2) of drawing 7, (3)) that selects a selectable printer with reference to data processing load information on each printer memorized by said memory based on the number of candidates of a printer selected by said 1st selection process, the 3rd selection process (a step (3) of drawing 7.) that selects a selectable printer which compares with the characteristic of said print job data the 2nd different attribution information from said 1st attribution information memorized by said memory based on the number of candidates of a printer selected by said 2nd selection process, and is adapted It has the 4th selection process (a step (6) of drawing 7, (7)) that selects a high printer of a selection priority as a candidate in two or more printers remembered to be (4) by said memory based on the number of candidates of a printer selected by said 3rd selection process.

[0013]the 9th invention concerning this invention -- said election process -- the [said 1st / the / -] -- a case where the number of candidates of a printer selected by selection process of three is the singular number -- the [each 1st / the / - / and] -- a printer selected by selection process of three is elected as a printer which should print print job data.

[0014]The 10th invention concerning this invention acquires periodically data processing load information on each printer that said acquisition process is changed with printing job execution from each printer by communication.

[0015]From resources information of each printer acquired beforehand, the 11th invention concerning this invention has the anticipation process (not shown) of expecting a rate of change of a processing load, and said election process, When the number of candidates of a printer selected by said 2nd selection process is plurality, one which should print print job data based on a potential result of said anticipation process of printers is elected.

[0016]The 12th invention concerning this invention individually print job data via predetermined communication media from two or more data processing devices (host computer 106,107 shown in drawing 1) Two or more 1st interfaces (interface 105,108 shown in drawing 1) receivable parallel, It is the storage which stored a program which a computer which controls apparatus which has two or more printers and two or more 2nd interfaces (printer interface 109,111,113 shown in drawing 1) that can be communicated can read, An acquisition process (step (1) of drawing 6) of acquiring data processing load information on each printer changed with printing job execution, A registration process (step (1) of drawing 6) of registering into a memory data processing load information on each printer acquired by said acquisition process, and an analysis process (step (3) of drawing 6) which analyzes the attribute of print job data which receive from one of data processing devices, The 1st and 2nd attribution information of each printer memorized by

data processing load information or said memory of each printer registered into an attribute and said memory of said print job data analyzed by said analysis process is compared. An election process (step (4) of drawing 6) of electing a printer which should print these print job data, A program which a computer which has a transfer process (step (5) of drawing 6) which shifts and transmits these print job data to that printer to be elected by said election process can read is stored in a storage.
[0017]The 13th invention concerning this invention said election process, The 1st selection process (step (1) of drawing 7) that selects a selectable printer which compares the 1st attribution information of each printer memorized by the characteristic and said memory of said print job data analyzed by said analysis process, and is adapted, The 2nd selection process (a step (2) of drawing 7, (3)) that selects a selectable printer with reference to data processing load information on each printer memorized by said memory based on the number of candidates of a printer selected by said 1st selection process, the 3rd selection process (a step (3) of drawing 7.) that selects a selectable printer which compares with the characteristic of said print job data the 2nd different attribution information from said 1st attribution information memorized by said memory based on the number of candidates of a printer selected by said 2nd selection process, and is adapted the 4th selection process (a step (6) of drawing 7.) that selects a high printer of a selection priority as a candidate in two or more printers remembered to be (4) by said memory based on the number of candidates of a printer selected by said 3rd selection process A program which a computer which has (7) can read is stored in a storage.
[0018]The 14th invention concerning this invention said election process, the [said 1st / the / -] -- a case where the number of candidates of a printer selected by selection process of three is the singular number -- the [each 1st / the / - / and] -- a program which a computer which elects a printer selected by selection process of three as a printer which should print print job data can read is stored in a storage.
[0019]The 15th invention concerning this invention stores in a storage a program of said acquisition process which can read a computer which acquires periodically data processing load information on each printer changed with printing job execution from each printer by communication.
[0020]From resources information of each printer acquired beforehand, the 16th invention concerning this invention has the anticipation process (not shown) of expecting a rate of change of a processing load, and said election process, When the number of candidates of a printer selected by said 2nd selection process is plurality, a program which a computer which elects one which should print print job data based on a potential result of said anticipation process of printers can read is stored in a storage.
[0021]
[Embodiment of the Invention][A 1st embodiment] Drawing 1 is a block diagram explaining the composition of the printing system which can apply the print control unit in which a 1st embodiment of this invention is shown, and two or more execution of a print job is possible for it, And when a system comprises a printing system constituted by the print control unit which controls by connecting them with the printer of the plurality which can answer the load of a printing job, and two host computers connected to a printing system via two or more interfaces, it corresponds.
[0022]In a figure, 101 is a printer controller part, 102 is CPU, the control program memorized by ROM104 and the memory resource which is not illustrated is executed,

and the whole is controlled.
[0023]103 is RAM, is used for the workspace of CPU102, etc., makes extended connection of the option RAM etc. which are not illustrated, and it is constituted so that the memory space can be extended. 105 is an interface part and performs the input-and-output communications processing which contains print job data between the host computers 106.
[0024]108 is an interface part and performs the input-and-output communications processing which contains print job data between the host computers 107.
[0025]109 is a printer interface and performs radial transfer of data between the printers 110. The printer 110 is provided with the function to be able to perform two or more print jobs and to answer the processing load by the print job under execution. 111 is a printer interface and performs radial transfer of data between the printers 112. The printer 112 is provided with the function to be able to perform two or more print jobs and to answer the processing load by the print job under execution. 113 is a printer interface and performs radial transfer of data between the printers 114. The printer 114 is provided with the function to be able to perform two or more print jobs and to answer the processing load by the print job under execution.
[0026]115 is printer processing-load memory storage, and memorizes the processing load to which it was answered from the printer 110,112,114. 116 is printer characteristic memory storage and has memorized the characteristic of the printer 110,112,114.
[0027]Drawing 2 is a figure showing an example of the printing job load information memorized by the printer processing-load memory storage 115 shown in drawing 1.
[0028]This embodiment shows the case where printing job load data is managed by making the name and load value of each printer 110,112,114 into a group.
[0029]Drawing 3 is a figure showing an example of the printer characteristic information memorized by the printer characteristic memory storage 116 shown in drawing 1.
[0030]This embodiment shows the case where the device name of each printer 110,112,114, the color attribute, the field attribute, the output position attribute, etc. are managed as printer characteristic data.
[0031]Drawing 4 is a figure showing an example of job data which receives from the host computer 106,107 shown in drawing 2.
[0032]This embodiment shows the case where job data comprise the attribute data 401, the print data 402, the page end 403, and the print job end 404, for example.
[0033]Drawing 5 is a figure showing the printout result outputted from each printer 110,112,114 shown in drawing 1, for example, corresponds to the output 501 of the job data shown in drawing 4.
[0034]Drawing 6 is a flow chart which shows an example of the 1st data-processing procedure in the print control unit concerning this invention. (1) - (5) shows each step.
[0035]First, at a step (1), CPU102 acquires processing-load data from the printer 110,112,114 connected, totals, and is stored in the printer processing-load memory storage 115.
[0036]Next, at a step (2), when it judges whether print job data are inputted into the interface 105 and the interface 108 and print job data are not inputted, CPU102 returns to a step (1) and repeats the same processing.
[0037]It explains as that into which the print job data shown in drawing 4 from the host computer 106 to the interface 105 to still more arbitrary timing are inputted hereafter.

[0038]On the other hand, when it judges with print job data being inputted at a step (2), CPU102 performs analysis processing of the attribute data 401 of the print job data shown in drawing 4 at a step (3). Next, when performing the optimal printer election manipulation routine based on the procedure shown in drawing 7 mentioned later and electing the optimal printer at a step (4), at a step (5). If the print job data concerned which shifted, transmitted print data to that printer, and were inputted into the interface 105 to be elected are transmitted to the printer 110 via the printer interface 109, it will return to a step (1).
[0039]Drawing 7 is a flow chart which shows an example of the 2nd data-processing procedure in the print control unit concerning this invention. (1) - (7) shows each step.
[0040]First, CPU102 performs limited processing of the printer by the characteristic of a print job at a step (1) from the contents of the printer characteristic memory storage 116 shown in the analysis result and drawing 3 of the print job data 401. Limitation of the printer by the characteristic of this print job is performed in order to avoid the print job execution by the unsuitable printer of not printing a color printing job to a monochrome printer, or not printing a double-side printing job with a single side printing device.
[0041]For example, since it is monochrome and single side printing when the attribute of a print job is the attribute data 401, the printer 110 and the printer 112 become a limited range.
[0042]Since a single bottle or a multi-bottle also has [an output process] the output position attribute possible for the two-copy output of the attribute data 401 of a print job, limitation by this print-job-data attribute is not performed.
[0043]Step (2) next, when it sets, a judgment of the number of limitation is made and the printer for a print-job-data attribute with suitable one does not remain. It progresses to a step (8), and the printer 110 and the printer 114 with the lightest processing load are elected from the contents of the printer processing-load memory storage 115 shown in drawing 2, and it progresses to a step (6).
[0044]On the other hand, since limited processing was completed at the step (2) when the number of the limited printers was one, it moves to the step (5) shown in drawing 6.
[0045]On the other hand, when it judges with two or more printers having been limited at a step (2), For example, it is judged that they are two or more printer limitation, like this example, since the printer 110 and the printer 112 are a limited range, move to a step (3), and CPU102, According to the contents of the printer processing-load memory storage 115 shown in drawing 2, a printer with the lowest printing job load is limited.
[0046]In the case of this example, the printer 110 is "0.5", and since the printer 112 is "0.8", it is limited to the printer 110.
[0047]Next, at a step (4), since the printer was limited to one, CPU102 ends selection processing and it moves from it to the step (5) shown in drawing 6.
[0048]On the other hand, when it judges with two or more printers remaining in the limited candidate at a step (4), it progresses to a step (5) and the limited processing in which the characteristic of a printer is employed efficiently is started. In under the present circumstances, the case so that it may be specified as the limitation which employs the characteristic of a printer efficiently by the attribute data 401 of print job data. That is, since it is a two-copy output and the output position attribute of the printer 112 is a multi-bottle, it will be judged that it is suitable for processing of print data in which the attribute data 401 of print job data is followed, and the printer 112 will be limited.

[0049]Next, in a step (6), when it judges whether the numbers of limitation are one, it, and plurality and is judged with it being one, processing is ended and it moves to the step (5) shown in drawing 6.
[0050]On the other hand, at a step (6), when not limited to one printer, at a step (7), it limits to the printer of the head of a limited printer list, printer limited processing is ended, and it moves to the step (5) shown in drawing 6.
[0051]Thus, the load of two or more printers connected and the characteristic of each printer which were detected periodically are acquired and managed, It becomes possible to elect the optimal printer for the attribute of print job data from printing systems with the combination of the load value and characteristic, and it becomes possible to process print job data in a suitable form with the optimal printer.
[0052][A 2nd embodiment] Although the above-mentioned embodiment explained the case where the optimal printer was elected based on the characteristic information of a printer, etc., The rate of change of a processing load is expected in consideration of this characteristic information, print speed, usable RAM capacity, etc., When the printer of two or more same minimum processing loads exists by the processing in the step (4) shown in drawing 7, it may constitute by limiting the minimum printer of change so that printing job load may be distributed more suitable for a printer.
[0053]Since the processing load of a printer is periodically read in a print control unit with printer processing-load memory storage and printer characteristic memory storage in a print control unit according to the above-mentioned embodiment, It is effective in becoming possible to choose the printer optimal for the print job data into which print job data were inputted from a host computer.
[0054]The printing system which can apply the print control unit hereafter applied to this invention with reference to the memory map shown in drawing 8 explains the composition of the data processing program which can be read.
[0055]Drawing 8 is a figure explaining the memory map of the storage which stores the various data processing program which can be read with the printing system which can apply the print control unit concerning this invention.
[0056]Although it does not illustrate in particular, the information by which the information which manages the program group memorized by the storage, for example, version information, a maker, etc. are remembered and for which it depends on OS by the side of program read-out, etc., for example, the icon etc. which carry out the discrimination expression of the program, may be memorized.
[0057]The data subordinate to various programs is also managed to the above-mentioned directory. The program for installing various programs in a computer, the program thawed when the program to install is compressed, etc. may be memorized.
[0058]The function shown in drawing 6 in this embodiment and drawing 7 may be carried out with the host computer by the program installed from the outside. And this invention is applied even when an information group including a program is supplied by the output unit from an external storage via storages, such as CD-ROM, a flash memory, and FD, or a network in that case.
[0059]As mentioned above, the storage which recorded the program code of the software which realizes the function of an embodiment mentioned above, Also when a system or a device is supplied and the computer (or CPU and MPU) of the system or a device reads and executes the program code stored in the storage, it cannot be overemphasized that the

purpose of this invention is attained.
[0060]In this case, the program code itself read from the storage will realize the new function of this invention, and the storage which memorized that program code will constitute this invention.
[0061]As a storage for supplying a program code, a floppy (registered trademark) disk, a hard disk, an optical disc, a magneto-optical disc, CD-ROM, CD-R, magnetic tape, a nonvolatile memory card, ROM, EEPROM, etc. can be used, for example.
[0062]By executing the program code which the computer read, Based on directions of the program code the function of an embodiment mentioned above is not only realized, but, It cannot be overemphasized that it is contained also when the function of an embodiment which performed a part or all of processing that OS (operating system) etc. which are working on a computer are actual, and was mentioned above by the processing is realized.
[0063]After the program code read from the storage was written in the memory with which the function expansion unit connected to the expansion board inserted in the computer or the computer is equipped, It cannot be overemphasized that it is contained also when the function of an embodiment which performed a part or all of processing that CPU etc. with which the expansion board and function expansion unit are equipped are actual, based on directions of the program code, and was mentioned above by the processing is realized.
[0064]
[Effect of the Invention]As explained above, according to the 1st invention concerning this invention, individually print job data from two or more data processing devices via predetermined communication media Two or more 1st interfaces receivable parallel, Two or more printers, two or more 2nd interfaces that can be communicated, and the acquisition means which acquires the data processing load information on each printer changed with printing job execution, The 1st memory measure that memorizes the data processing load information on each printer acquired by said acquisition means, The 2nd memory measure that memorizes the 1st and 2nd attribution information of each printer, and an analysis means to analyze the attribute of the print job data received from one of data processing devices, The 1st and 2nd attribution information of each printer memorized by the data processing load information or said 2nd memory measure of each printer memorized by the attribute and said 1st memory measure of said print job data analyzed by said analysis means is compared. Since it has a selecting means which elects the printer which should print these print job data, and a transfer means which shifts and transmits these print job data to that printer to be elected by said selecting means, The destination of the print job data received via each interface can be elected in consideration of the data processing load of each selectable printer, The situation where the print job data received to the printer of the waiting for a mere print job are transmitted, a data-processing burden increases too much, and printing job time attains to a long time is avoided, The print job data received to the optimal printer with little data processing load can be transmitted, and a printed result can be obtained in a short time.
[0065]The 1st selection means that selects the selectable printer which according to the 2nd invention said selecting means compares the 1st attribution information of each printer memorized by the characteristic and said 2nd memory measure of said print job data analyzed by said analysis means, and is adapted, The 2nd selection means that

selects a selectable printer with reference to the data processing load information on each printer memorized by said 1st memory measure based on the number of candidates of the printer selected by said 1st selection means, The 3rd selection means that selects the selectable printer which compares with the characteristic of said print job data the 2nd different attribution information from said 1st attribution information memorized by said 2nd memory measure based on the number of candidates of the printer selected by said 2nd selection means, and is adapted, Since it has the 4th selection means that selects the high printer of a selection priority as a candidate in two or more printers memorized by said 1st memory measure based on the number of candidates of the printer selected by said 3rd selection means, In consideration of the data processing load state of the attribute of a printer, or a printer, the optimal printer can be narrowed down as the destination of the print job data received via each interface.

[0066]According to the 3rd invention, when the number of candidates of the printer selected by said 1st [the] - the 3rd selection means is the singular number, said selecting means, Since the printer selected by each 1st [the / -] and the 3rd selection means is elected as a printer which should print print job data, the optimal printer that should be made the destination of the print job data received via each interface can be elected in a short time.

[0067]Since said acquisition means acquires periodically the data processing load information on each printer changed with printing job execution from each printer by communication according to the 4th invention, Even if it changes the data processing load of each printer, in consideration of the newest data processing load information, a printer can always be elected.

[0068]According to the 5th invention, from the resources information of each printer acquired beforehand, have an anticipation means to expect the rate of change of a processing load, and said selecting means, Since one which should print print job data based on the potential result of said anticipation means of printers is elected when the number of candidates of the printer selected by said 2nd selection means is plurality, Even when the situation of the printer which became a candidate being taken out two or more election, and competing occurs, the only adapted printer in which the fastest processing is possible can be elected.

[0069]According to the 6th invention, it is the print control unit and the printer which can be communicated which control two or more of other printers via predetermined communication media, The creating means which analyzes the print job data received from said print control unit, and generates the print data which can print a printing department, Since it has a measuring means which measures the data-processing burden by said creating means, and a transfer means which transmits the data processing load information measured by said measuring means based on the acquisition request from said print control unit to said print control unit, The data processing load information which measured the data-processing burden by the side of the printer changed by processing of the print job data transmitted, responded for asking from a print control unit, and was this measured can be transmitted certainly.

[0070]According to the 7th and 12th invention, individually print job data from two or more data processing devices via predetermined communication media Two or more 1st interfaces receivable parallel, It is a data processing method of the print control unit which has two or more printers and two or more 2nd interfaces that can be

communicated, Individually print job data from two or more data processing devices via predetermined communication media Or two or more 1st interfaces receivable parallel, It is the storage which stored the program which the computer which controls the apparatus which has two or more printers and two or more 2nd interfaces that can be communicated can read, The acquisition process of acquiring the data processing load information on each printer changed with printing job execution, The registration process of registering into a memory the data processing load information on each printer acquired by said acquisition process, The analysis process which analyzes the attribute of the print job data received from one of data processing devices, The election process of electing the printer which compares the 1st and 2nd attribution information of each printer memorized by the data processing load information or said memory of each printer registered into the attribute and said memory of said print job data analyzed by said analysis process, and should print these print job data, Since it has a transfer process which shifts and transmits these print job data to that printer to be elected by said election process, The destination of the print job data received via each interface can be elected in consideration of the data processing load of each selectable printer, The situation where the print job data received to the printer of the waiting for a mere print job are transmitted, a data-processing burden increases too much, and printing job time attains to a long time is avoided, The print job data received to the optimal printer with little data processing load can be transmitted, and a printed result can be obtained in a short time.

[0071]According to the 8th and 13th invention, said election process, The 1st selection process that selects the selectable printer which compares the 1st attribution information of each printer memorized by the characteristic and said memory of said print job data analyzed by said analysis process, and is adapted, The 2nd selection process that selects a selectable printer with reference to the data processing load information on each printer memorized by said memory based on the number of candidates of the printer selected by said 1st selection process, The 3rd selection process that selects the selectable printer which compares with the characteristic of said print job data the 2nd different attribution information from said 1st attribution information memorized by said memory based on the number of candidates of the printer selected by said 2nd selection process, and is adapted, Since it has the 4th selection process that selects the high printer of a selection priority as a candidate in two or more printers memorized by said memory based on the number of candidates of the printer selected by said 3rd selection process, In consideration of the data processing load state of the attribute of a printer, or a printer, the optimal printer can be narrowed down as the destination of the print job data received via each interface.

[0072]According to the 9th and 14th invention, said election process, the [said 1st / the / -], when the number of candidates of the printer selected by the selection process of three is the singular number, the [each 1st / the / - / and] -- since the printer selected by the selection process of three is elected as a printer which should print print job data, the optimal printer that should be made the destination of the print job data received via each interface can be elected in a short time.

[0073]According to the 10th and 15th invention, said acquisition process, Since the data processing load information on each printer changed with printing job execution is periodically acquired from each printer by communication, even if it changes the data processing load of each printer, in consideration of the newest data processing load

information, a printer can always be elected.

[0074]According to the 11th and 16th invention, from the resources information of each printer acquired beforehand, have the anticipation process of expecting the rate of change of a processing load, and said election process, Since one which should print print job data based on the potential result of said anticipation process of printers is elected when the number of candidates of the printer selected by said 2nd selection process is plurality, Even when the situation of the printer which became a candidate being taken out two or more election, and competing occurs, the only adapted printer in which the fastest processing is possible can be elected.

[0075]Therefore, two or more print job data are received in parallel from two or more data processing devices, When two or more printers which can transmit the received this print job data exist, Can optimize the election candidate of a printer who should transmit these print job data, and the situation which chooses a mistaken printer whose data-processing burden increases superfluously is avoided, Even if it receives two or more print job data in parallel from two or more data processing devices, the effect of being able to fix the printing job environment where a printed result can be obtained efficiently in a short time, free is done so.

[Translation done.]